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- OBJECTIVES** To develop new knowledge in the field of speech processing, signal processing and machine learning.
- RESEARCH INTERESTS** Acoustic speech processing, voice analysis, statistical pattern recognition and machine learning, nonlinear signal processing and neural networks, speech recognition, affective speech computing.
- EDUCATION**
- ◇ **Imperial College**, London, UK
 - Ph.D. in Signal Processing, March 2007
 - Thesis title: Voice Source Cepstrum Processing for Speaker Identification
 - Advisor: Mike Brookes
 - ◇ **University of Iceland**, Reykjavik, Iceland
 - M.Sc. in Signal Processing, June 2000
 - Thesis title: Nonlinear System Identification of Speech with Recurrent Neural Networks
 - Advisor: Jon Atli Benediktsson
 - B.Sc. in Electrical Engineering, June 1999
 - ◇ **Akureyri Junior College**, Akureyri, Iceland
 - Matriculation with emphasis on physics and mathematics, June 1995
- AWARDS**
- ◇ **Icelandic Language Board (October 2012)**
Project: Developing speech recognition for Icelandic
To build an open database of spoken Icelandic and the subsequent development of speech recognition for Icelandic by Google.
 - ◇ **Royal Academy of Engineering - Global Research Award (October 2008)**
Project: Speech Analysis for High Performance Phoneme Recognition
To visit and work with Professor Dan Ellis at LabROSA, Columbia University for 12 months
- RESEARCH PROJECTS**
- ◇ **Computer aided pronunciation training in Icelandic (2021 -2023)**
PI: Jon Guðnason.
 - ◇ **Language Technology Programme for Icelandic - ASR and TTS parts (2018 -2022)**
PI: Jon Guðnason.
 - ◇ **Environment to build text to speech synthesis for Icelandic (2017-2019)**
PI: Jon Guðnason, Eiríkur Rognvaldsson and Steinþor Steingrímsson.
 - ◇ **Model-based speech analysis and voice quality assessment(2015-2017)**
PI: Jon Guðnason
Assessment of voice quality using model-based speech analysis methods.
 - ◇ **Free and Open Speech Recognition for Icelandic (2015-2017)**
PI: Jon Guðnason and Trausti Kristjánsson
Developing open source software for Icelandic speech recognition.
 - ◇ **Automatic Speech Recognition for Althingi (2014-2018)**
PI: Jon Guðnason
Automating the transcription process of parliamentary speeches.

- ◇ **Automatic Speech Recognition for Icelandic Radiologists (2013-2019)**
PI: Jon Gudnason
Dictation system using Automatic speech recognition in radiology.
- ◇ **Cognitive Workload Monitoring for Air Traffic Control using Speech (2012-2015)**
PI: Kamilla Run Johannsdottir, Jon Gudnason and Hannes Hogni Vilhjalmsson
Using voice source analysis to monitor cognitive workload.
- ◇ **Voice source extraction and modeling (2009-2011)**
PI: Jon Gudnason
Voice source prototype clustering for speech synthesis and coding.
- ◇ **Speech Analysis for Phoneme Recognition at Columbia University (2008-2009)**
PI: Daniel P. W. Ellis
Glottal flow and vocal tract analysis for speech feature extraction

WORK
EXPERIENCE

- ◇ **Director of CADIA**
Reykjavik University (2016 - 2019)
Center for Analysis and Design of Intelligent Agents
- ◇ **Associate Professor**
Reykjavik University (2017 - Present)
Research and teaching in the field of speech and language technology, signal processing and machine learning
- ◇ **Chairman of the board**
Tiro - language technology (2016 - Present)
Speech recognition for Icelandic
- ◇ **Board member**
Almannarómur (2013 - 2017)
Association for Icelandic Language Technology
- ◇ **Assistant Professor**
Reykjavik University (2009 - 2017)
Research and teaching in the field of speech and language technology, signal processing and machine learning
- ◇ **Research Assistant**
Communications and Signal Processing Group, Imperial College London (2003-2009)
Signal Processing Laboratory, University of Iceland (1999 - 2000)
Hydrology Service, Iceland National Energy Authority (Summers, 1996 - 1998)

GRADUATE
SUPERVISION

- ◇ **Doctoral students**
Guolin Fang (enrolled 2021) : Parameters for Text-to-Speech Synthesis
Shijun Wang (enrolled 2021) : Learning Prosody Representation for Controllable Expressive Text-to-Speech
Helga Svala Sigurðardóttir (enrolled 2020) : Text normalization for Icelandic
Eydis Huld Magnusdottir (2019) - Cognitive workload classification with psychophysiological signals for monitoring in safety critical situations
- ◇ **Masters students**
Luke O'Brien (2021) : Phonetic error analysis in ASR for L2 speakers
David Erik Mollberg (2021) : Autoencoding parameters for Automatic Speech Recognition
Guolin Fang (2021) : Vocoding for Icelandic TTS systems
Egill Hlodversson (2020) : Dialogue systems for Icelandic
Anna Vigdis Runarsdottir (2018) : Re-scoring word lattices from automatic speech recognition system based on manual error corrections
Halla Marinisdottir (2018) : Applications of different machine learning methods for water level predictions
Erling Gauti Jonsson (2018) : Forecast modelling for the Icelandic automotive market

Eydis Huld Magnúsdóttir (2013) : Speech based cognitive workload monitoring model based on pattern recognition methods
Simon Elvar Vilhjálmsson (2013) : Automatic inspection robot for an aluminium plant
Guðjon Hugberg Björnsson (2012) : Automatic thermal inspection of aluminium reduction cell
Agnar Sveinsson (2012) : INS/GPS error analysis and integration
Hendrik Tómasson (2011) : Speaker localization and identification

- IT - SKILLS ◇ Python, Matlab, Kaldi, bash scripting, C++, HTK, LaTeX, Linux, MacOS
- TRANSFERABLE SKILLS ◇ Native spoken/written Icelandic and English; fair German and Danish
 ◇ Courses taken in: Technical writing, presentation methods, time management
- REVIEWER ◇ Elsevier Speech Communications
 ◇ European Signal Processing Conference (EUSIPCO)
 ◇ IEEE Transactions on Audio, Speech and Language Processing
 ◇ IEEE International Conference on Acoustics, Speech and Signal Processing
- PRESENTATIONS ◇ Talk at MIT Lincoln Labs on monitoring cognitive workload using speech, 2019
 ◇ Talk at Imperial College London Communications and Signal Processing Group on speech signal processing at Reykjavik University, 2018
 ◇ Talk at Reykjavik University on Automatic Speech Recognition for Icelandic, 2018
 ◇ Talk at Icelandic Mathematical Society on supervised training of neural networks, 2016
 ◇ Talk at University of New South Wales on using speech for cognitive workload analysis, 2015
 ◇ Talk at UTMessan on Automatic Speech Recognition for Icelandic, 2015

- BOOK CHAPTER ◇ Gudnason, J., “Speech Production Modeling and Analysis”. In: *Rama Chellappa and Sergios Theodoridis, editors, Academic Press Library in Signal Processing. Vol 4, Image, Video Processing and Analysis, Hardware, Audio, Acoustic and Speech Processing*, Chennai: Academic Press, 2014, pp. 985-1018.
- SPECIAL REPORT ◇ A.B. Nikulásdóttir, J. Guðnason, S. Steingrímsson. “Máltækni fyrir íslensku 2018-2022: verkáætlun.” *Mennta-og menningarmálaráðuneytið* (National Programme for Language Technology for Icelandic).
- JOURNAL PUBLICATIONS ◇ E.H. Magnúsdóttir, K.R. Johannsdóttir, A. Majumdar, J. Guðnason. “Assessing Cognitive Workload using Cardiovascular Measures and Voice.” *Sensors* Accepted. 2022
- ◇ Y.R. Chien, J. Guðnason. “Acoustic Measure of Vocal Strain Based on Glottal Airflow Periodicity.” *IEEE/ACM Transactions on Audio, Speech, and Language Processing* 29 563-574. 2020
- ◇ K.R. Jóhannsdóttir, E.H. Magnúsdóttir, S. Sigurjónsdóttir, J. Guðnason “The role of working memory capacity in cardiovascular monitoring of cognitive workload.”, *Biological psychology* 132, 154. 2018
- ◇ M. Borsky, D.D. Mehta, J.H. Van Stan, J. Guðnason, “Modal and nonmodal voice quality classification using acoustic and electroglottographic features.”, *IEEE/ACM Transactions on Audio, Speech, and Language Processing Special Issue on Biosignal-based Spoken Communication* 55, pp 2281-2291. 2017
- ◇ Y.R. Chien, D. Mehta, J. Gudnason, M. Zanartu and T.F. Quatieri “Evaluation of Glottal Inverse Filtering Algorithms Using a Physiologically Based Articulatory Speech Synthesizer”, *IEEE/ACM Trans on Audio, Speech & Language Processing*, Vol PP(99), 2017.
- ◇ E.H. Magnúsdóttir, M. Borsky, M. Meier, K. Johannsdóttir, J. Gudnason “Monitoring Cognitive Workload Using Vocal Tract and Voice Source Features”, *Periodica Polytechnica Electrical Engineering and Computer Science*, 2017.
- ◇ Drugman, T., Thomas, M.R.P., Gudnason, J., Naylor, P.A. and Dutoit, T. “Detection of Glottal Closure Instants from Speech Signals: a Quantitative Review”, *IEEE Trans on Audio, Speech & Language Processing*, Vol 20(3), pp 994 - 1006, March 2012.
- ◇ Gudnason, J., Thomas, M. R. P., Ellis, D. P. W., and Naylor, P. A., “Data-driven Voice Source Analysis and Synthesis”, *Speech Communication*, Vol 54(2), pp 199 - 211, February 2012.
- ◇ Thomas, M. R. P., Gudnason, J., and Naylor, P. A., “Estimation of Glottal Closing and Opening Instants in Voiced Speech using the YAGA Algorithm”, *IEEE Trans on Audio, Speech & Language Processing*, Vol 20(1), pp 82 - 91, January 2012.
- ◇ Gudnason, J., Cui, J. and Brookes, M. , “HRR Automatic Target Recognition from Super-Resolution Scattering Center Features”, *IEEE Trans on Aerospace and Electronic Systems*, Vol 45(4) pp 1512–1524, November 2009.
- ◇ Naylor, P.A., Kounoudes, A., Gudnason, J. and Brookes, M., “Estimation of Glottal Closure Instants in Voiced Speech using the DYPSA Algorithm”, *IEEE Trans on Audio, Speech & Language Processing*, Vol 15(1), pp 34-43, January 2007.
- ◇ Brookes, M., Naylor, P.A. and Gudnason, J., “A Quantitative Assessment of Group Delay Methods for Identifying Glottal Closures in Voiced Speech”, *IEEE Trans on Audio, Speech & Language Processing*, Vol 14(2), pp 456-466, March 2006.
- CONFERENCE PUBLICATIONS ◇ Shijun Wang, Hamed Hemati, Jón Guðnason, and Damian Borth “Generative Data Augmentation Guided by Triplet Loss for Speech Emotion Recognition.” *Interspeech*. Incheon. 2022.
- ◇ Carlos Daniel Hernandez Mena, David Erik Mollberg, Michal Borský, Jón Guðnason. “Samrómur Children: An Icelandic Speech Corpus”. InLREC 2022 Workshop Language Resources and Evaluation Conference 20-25 June 2022 Jun 20
- ◇ Staffan Hedström, David Erik Mollberg, Ragnheiður Þórhallsdóttir, Jón Guðnason. “Samrómur: Crowd-sourcing large amounts of data”. InLREC 2022 Workshop Language Resources and Evaluation Conference 20-25 June 2022 Jun 20

- ◇ Tadić M, Farkaš D, Filko M, Vasiļevskis A, Vasiļjevs A, Ziediņš J, Motika Ž, Fishel M, Loftsson H, Guðnason J, Borg C. “National Language Technology Platform for Public Administration”. InLREC 2022 Workshop Language Resources and Evaluation Conference 20-25 June 2022 Jun 20
- ◇ Nikulásdóttir AB, Arnardóttir Þ, Guðnason J, Daði Þ, Gunnarsson AK, Jónsson HP, Loftsson H, Óladóttir H, Sigurðsson EF, Sigurgeirsson AÞ, Snæbjarnarson V. “Help Yourself from the Buffet: National Language Technology Infrastructure Initiative on CLARIN-IS”. InCLARIN Annual Conference 2021 (p. 124).
- ◇ Sigurgeirsson, Atli, et al. “Talrómur: A large Icelandic TTS corpus.” *Proceedings of the 23rd Nordic Conference on Computational Linguistics (NoDaLiDa)*. 2021.
- ◇ Helga Svala Sigurðardóttir, Anna Björk Nikulásdóttir, Jón Guðnason “Creating Data in Icelandic for Text Normalization” *Proceedings of the 23rd Nordic Conference on Computational Linguistics (NoDaLiDa)*. 2021.
- ◇ Mollberg, David Erik, et al. “Samrómur: Crowd-sourcing data collection for icelandic speech recognition.” *Proceedings of The 12th Language Resources and Evaluation Conference*. 2020.
- ◇ Sigurgeirsson, Atli, Gunnar Örnólfsson, and Jón Guðnason. “Manual speech synthesis data acquisition—from script design to recording speech.” *Proceedings of the 1st Joint Workshop on Spoken Language Technologies for Under-resourced languages (SLTU) and Collaboration and Computing for Under-Resourced Languages (CCURL)*. 2020
- ◇ I.R. Helgadóttir, J. Fong, A.B. Nikulasdóttir, R. Kjaran, J. Gudnason. “The Althingi ASR System.” *Interspeech*, Graz. 2019.
- ◇ A.V. Runarsdóttir, I.R. Helgadóttir, J. Gudnason. “Lattice Re-Scoring During Manual Editing for Automatic Error Correction of ASR Transcripts.” *Interspeech*, Graz. 2019.
- ◇ Y.R. Chien, M. Borsky, J. Gudnason. “F0 Variability Measures Based on Glottal Closure Instants.” *Interspeech*, Graz. 2019.
- ◇ A.B. Nikulasdóttir, J. Gudnason. “Bootstrapping a Text Normalization System for an Inflected Language. Numbers as a Test Case.” *Interspeech*, Graz. 2019.
- ◇ A.B. Nikulásdóttir, I.R. Helgadóttir, M. Pétursson and J. Gudnason. “Open ASR for Icelandic: Resources and a Baseline System.” *Language Resources and Evaluation Conference (LREC)*, Miyazaki, May 2018
- ◇ S. Steingrímsson, S. Helgadóttir, E. Rögnvaldsson, S. Barkarson, J. Gudnason. “Risamálheild: A Very Large Icelandic Text Corpus.” *Language Resources and Evaluation Conference (LREC)*, Miyazaki, May 2018
- ◇ S. Steingrímsson, J. Guðnason, S. Helgadóttir, E. Rögnvaldsson. “Málrómur: A Manually Verified Corpus of Recorded Icelandic Speech.” *Proceedings of the 21st Nordic Conference on Computational Linguistics, NoDaLiDa*, 131. pp 237–240. Gothenburg, May 2017.
- ◇ J. Gudnason, M. Petursson, R. Kjaran, Simon Klupfel, A.B. Nikulasdóttir. “Building ASR corpora using Eyra.” *Interspeech*, Stockholm. 2017.
- ◇ I.R. Helgadóttir, R. Kjaran, A. B. Nikulasdóttir, J. Gudnason “Building an ASR corpus using Althingi’s Parliamentary Speeches.” *Interspeech*, Stockholm. 2017.
- ◇ Y.R. Chien, M. Borsky, J. Gudnason “Objective Severity Assessment From Disordered Voice Using Estimated Glottal Airflow.” *Interspeech*, Stockholm. 2017.
- ◇ M. Borsky, M. Cocude, D. D. Mehta, M. Zanartu, J. Gudnason. “Classification of voice modes using neck-surface accelerometer data,” *Proc. International Conf. Acoustics, Speech and Signal Processing. (ICASSP)*, New Orleans 2017.
- ◇ Manuela Meier, Michal Borsky, Eydis H. Magnusdóttir, Kamilla R. Johannsdóttir and Jon Gudnason. “Vocal tract and voice source features for monitoring cognitive workload,” *IEEE CogInfoCom*, 2016.

- ◇ Michal Borsky, Daryush D Mehta, Julius P Gudjohnsen, Jon Gudnason, et al. “Classification of Voice Modality Using Electroglottogram Waveforms.” *Interspeech*, San Francisco. pp-3166-3170. 2016.
- ◇ Petursson, Matthias, Simon Klupfel, and Jon Gudnason. “Eyra-Speech Data Acquisition System for Many Languages,” *Procedia Computer Science*, 81: pp-53-60. 2016.
- ◇ van der Werff, L., Gudnason, J., Johannsdottir, K. R., “Detection of Cardiovascular Reactivity in Speech,” *Interspeech*, Dresden 2015.
- ◇ Gudnason, J., Mehta, D.D., Quatieri, T.F., “Evaluation of Speech Inverse Filtering Techniques using a Physiologically-Based Synthesizer,” *Proc. International Conf. Acoustics, Speech and Signal Processing. (ICASSP)*, Brisbane 2015.
- ◇ Gudnason, J., Mehta, D.D., Quatieri, T.F., “Closed Phase Estimation for Inverse Filtering the Oral Airflow Waveform,” *Proc. International Conf. Acoustics, Speech and Signal Processing. (ICASSP)*, Florence 2014.
- ◇ Gudnason, J., Kjartansson, O., Johannsson, J., Carstensdottir, E., Vilhjalmsón, H., Loftsson, H., Helgadóttir, S., Johannsdottir, K. and Rognvaldsson, E. “Almannarómur: an open Icelandic speech corpus,” *Spoken Language Technologies for Under-resourced Languages.*, Cape Town 2012.
- ◇ Thomas, M. R. P., Gudnason, J., Naylor, P. A., Geiser, B. and Vary, P., “Voice Source Waveform Analysis and Synthesis using Principal Component Analysis and Gaussian Mixture Modelling,” *Proc. International Conf. Acoustics, Speech and Signal Processing. (ICASSP)*, Dallas 2010.
- ◇ Gudnason, J., Thomas, M. R. P., Naylor, P. A. and Ellis, D. P. W., “Voice Source Waveform Analysis and Synthesis using Principal Component Analysis and Gaussian Mixture Modelling,” *Interspeech*, (Brighton 2009).
- ◇ Thomas, M. R. P., Gudnason, J. and Naylor, P. A., “Detection of Glottal Closing and Opening Instants using an Improved DYPSA Framework,” *Proc. European Signal Processing Conf. (EUSIPCO)*, (Glasgow 2009).
- ◇ Thomas, M. R. P., Gudnason, J. and Naylor, P. A., “Data-Driven Voice Source Waveform Modelling,” *Proc. International Conf. Acoustics, Speech and Signal Processing. (ICASSP)*, Taipei, 2009.
- ◇ Thomas, M. R. P., Gudnason, J. and Naylor, P. A., “Application for the DYPSA Algorithm to Segmented Time Scale Modification of Speech,” *Proc. European Signal Processing Conf. (EUSIPCO)*, Lausanne, 2008.
- ◇ Cui, J., Gudnason, J. and Brookes, M., “Hidden Markov Models for Multi-Perspective Radar Target Recognition,” *Proc. IEEE Int. RADAR Conference*, Rome, 2008.
- ◇ Gudnason, J. and Brookes, M., “Voice Source Cepstrum Coefficients for Speaker Identification,” *Proc. International Conf. Acoustics, Speech and Signal Processing. (ICASSP)*, pp. 4821 - 4824, Las Vegas, 2008
- ◇ Gaubitch, N. D., Thomas, M. R. P., Gudnason, J. and Naylor, P. A., “A Practical Multichannel Dereverberation Algorithm using Multichannel DYPSA and Spatiotemporal Averaging,” *Proc Workshop on App. of Signal Processing to Audio and Acoust. (WASPAA)*, New Platz, 2007.
- ◇ Maqsood, H., Gudnason, J. and Naylor, P. A., “Enhanced Robustness to Unvoiced Speech and Noise in the DYPSA Algorithm for Identification of Glottal Closure Instants,” *Proc. European Signal Processing Conf. (EUSIPCO)*, Poznan, 2007.
- ◇ Cui, J., Gudnason, J. and Brookes, M., “Maximum A-Posteriori Adaptive Masking for Clutter Suppression in Automatic Radar Target Recognition,” *Proc. IEEE RADAR Conference*, Verona, 2006.
- ◇ Cui, J., Gudnason, J. and Brookes, M., “Radar shadow and superresolution features for automatic recognition of MSTAR targets,” *Proc. IEEE Int. RADAR Conference*, pp.534 - 539, Arlington, 2005

- ◇ Cui, J., Guðnason, J. and Brookes, M., “Automatic recognition of MSTAR targets using radar shadow and superresolution features,” *Proc. International Conf. Acoustics, Speech and Signal Processing. (ICASSP)*, pp.V-589 - V-592, Philadelphia, 2005